

EARLY HOLOCENE HUMAN SETTLEMENT IN EASTERN JAVA

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ABSTRACT

The eastern part of Java, which extends from Gunung Sewu to the eastern tip of the island, is a very significant region for the study of prehistoric cave occupation. Current research has unearthed remains dating to the Late Pleistocene, beginning c. 45,000 BP. Human activity continued into the Holocene, with cultural developments exclusive to East Java. This paper discusses Early Holocene human settlements in this region, representing a cultural stage called the Keplek Phase. During this period, a number of typical cultural characteristics have been identified, including intensive exploitation of caves and rock shelters for habitation, workshop and burial activities; an abundant lithic flake industry; and a bone, antler, and shell tool technology. There is also evidence for subsistence and burial practices. These cultural characteristics have been discovered in caves in seven limestone formations, located in the Gunung Sewu, Sampung (Ponorogo), Tulung Agung, Dander (Bojonegoro), Tuban, Puger (Jember) and Situbondo regions.

The physiography of Eastern Java consists of the Southern Mountains (Gunung Sewu) in the south, east-west mountain ranges intercalated by lowlands in the centre, the Kendeng anticline and Randublatung depression in the north, and the Rembang-Madura hills and coastal zone in the extreme north. Eastern Java is a privileged region for prehistoric research for it preserves numerous sites dating from the Palaeolithic through to the Palaeometallic (Bronze-Iron Age). The bed of the Kali Baksoka near Pacitan contains a very prolific Palaeolithic site, bearing an abundance of lithic tools popularly referred to as Pacitanian. The dating of this assemblage is, however, still in dispute (van Heekeren 1972: 35). A number of well known hominid fossil sites occur in this region, at Sambungmacan, Ngawi, Ngandong, and Kedungbrubus. Further to the east, in the Pening area, lies

the find place of the important Mojokerto *Homo erectus* child.

Eastern Java is becoming increasingly more important with regard to its limestone cave sites, most of which were occupied in prehistoric times (Figure 1). The first excavation of an East Java cave was in 1926, by van Es (1929) at Gua Lawa near Sampung (Ponorogo). Two years later, from 1928 to 1931, van Stein Callenfels conducted a re-excavation of Gua Lawa and reported that the 'bearing deposits were 3-4 m in thickness. In the upper layers a few iron and bronze objects and modern potsherds were found intermingled with a number of Neolithic adzes. The next layer below contained exclusively implements of bone and antler (spatulas, points, awls, fishhooks). The third layer down yielded Neolithic specimens, including bifacially flaked stone arrowheads, cord marked potsherds, and pestles and mortars (van Heekeren 1972:94). Human burials in a flexed position were also encountered in this layer (van Stein Callenfels 1932:24).

Van Stein Callenfels's excavation stimulated research in other caves in East Java. In the 1930s, Willems explored caves in the limestone formations in the Tuban and Bojonegoro regions. He excavated some, and unearthed finds similar to Gua Lawa in terms of the bone, antler and shell tools. About 100 km south of Gua Lawa, in the Punung region, von Koenigswald excavated a cave located on the eastern side of Gunung Cantelan in 1936. A large number of flake tools, animal teeth, mollusc shells and isolated human teeth were discovered (Erdbrink 1954:297).

Still in the 1930s, van Heekeren found further traces of the Sampung bone industry in Gua Betpuruh in Gunung Beser, north of Prajekan, Situbondo. The cultural deposits in this cave were very thin. Potsherds were confined to the upper layers, while lithic and bone artefacts with human remains similar to those from Gua Lawa were discovered in the lower layers. Van Heekeren (1972:103) considered that the human remains bore a resemblance to Australian and New Guinea populations. Other sites excavated by van Heekeren were Marjan cave and Sodong rock shelter in the

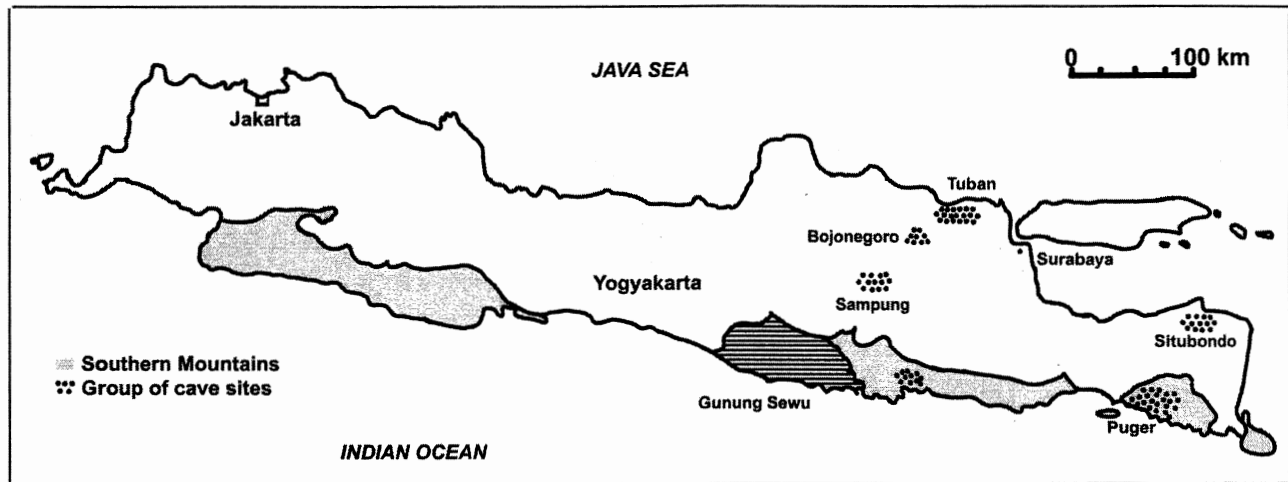


Figure 1: The distribution of cave sites in Eastern Java.

Puger (Jember) area, where flake tools, bone tools, faunal and human remains and marine shells were recovered. Van Heekeren (1972:105) claimed that Hoabinhian pebble tools occurred in these caves, but no subsequent reports have confirmed this.

The similarities of these East Java finds, especially the bone and lithic tools, motivated van Heekeren (1972:92) to identify this cultural unit as the 'Sampung Bone Industry', characterised by bone, antler and shell tools of various types, shell ornaments, stone pestles and mortars, primary flakes and blades, projectile points of stone with a round base, use of red pigment in primarily flexed burials, and a few cord-marked potsherds. However, the cultural stratigraphy of Gua Lawa remains confusing because of the presence of Neolithic objects below the bone industry. This sequence is not found in other caves, and Gua Lawa has no absolute dates.

After the outbreak of the Second World War there was a long hiatus in research in Eastern Java. Revival in the 1990s was focused on a number of caves in the Gunung Sewu, Sampung, Campurdarat (Tulungagung), Dander (Bojonegoro), Tuban, and Puger (Jember) limestone formations. In the Gunung Sewu region, excavations have been conducted in Keplek, Braholo (Simanjuntak 1998), Song Terus and Tabuhan caves. The last two are being excavated by an Indonesian-French team. In the Ponorogo region, a re-excavation of Gua Lawa itself is being conducted (Driwantoro 1999). Some other sites in the vicinity of Gua Lawa, like Gua Layah and the Tutup and Ngalem rock shelters, have been excavated by Balai Arkeologi Yogyakarta (Asikin 2002).

Re-excavation has been recently performed by Nurani Asikin in several caves in the Bojonegoro region, namely Pawon, Gampeng, Payung and Grajen. In the Tuban region,

a re-excavation of Peturon cave has been undertaken by the National Research Centre of Archaeology, in cooperation with ORSTOM France (Djatkiko 1997). Re-excavations have also been conducted in the Puger region of Jember by Balai Arkeologi Yogyakarta, namely in the Marjan, Macan, and Gelatik caves (Asikin 2002). New cave sites (Song Gentong 1 and 2) in the limestone formation of Campurdarat near Tulungagung have been recently excavated by the Archaeological Research Centre of Indonesia in cooperation with ORSTOM (Marliac and Simanjuntak 1998). All this recent work has provided a better understanding of human settlement in the early Holocene period in this region.

THE KEPLEK LAYER IN SONG KEPLEK

Song Keplek, or Keplek Cave, is situated in the Punung region in the eastern part of Gunung Sewu (Figure 2). It was excavated during the 1990s and a cultural stratigraphy was encountered that extended from 24,000 to 2000 BP. Three stages of human occupation have been identified in this cave, i.e. Late Pleistocene, Preneolithic, and Neolithic. The Late Pleistocene (c. 24,000 - 12,000 BP on C14 dates) was characterised by crude lithics with a few flake tools (Table 1). The faunal remains consist of big mammals such as cervids, bovids and elephants, together with pigs and rodents. This layer has yielded distinctive cultural remains of the Late Pleistocene Tabuhan Phase, named after Song Tabuhan (Tabuhan Cave) where the oldest systematic cave occupation, C14-dated to about 45,000 BP, has been identified (Sémah *et al.* 2002:181). The Neolithic is situated in the uppermost part of the Song Keplek sequence and is dated to c. 4000-2000 BP (Table 1). It is characterised by potsherds and unfinished adzes, and is called the Gupuh Phase after the cave of Song Gupuh (Simanjuntak 2002:255).

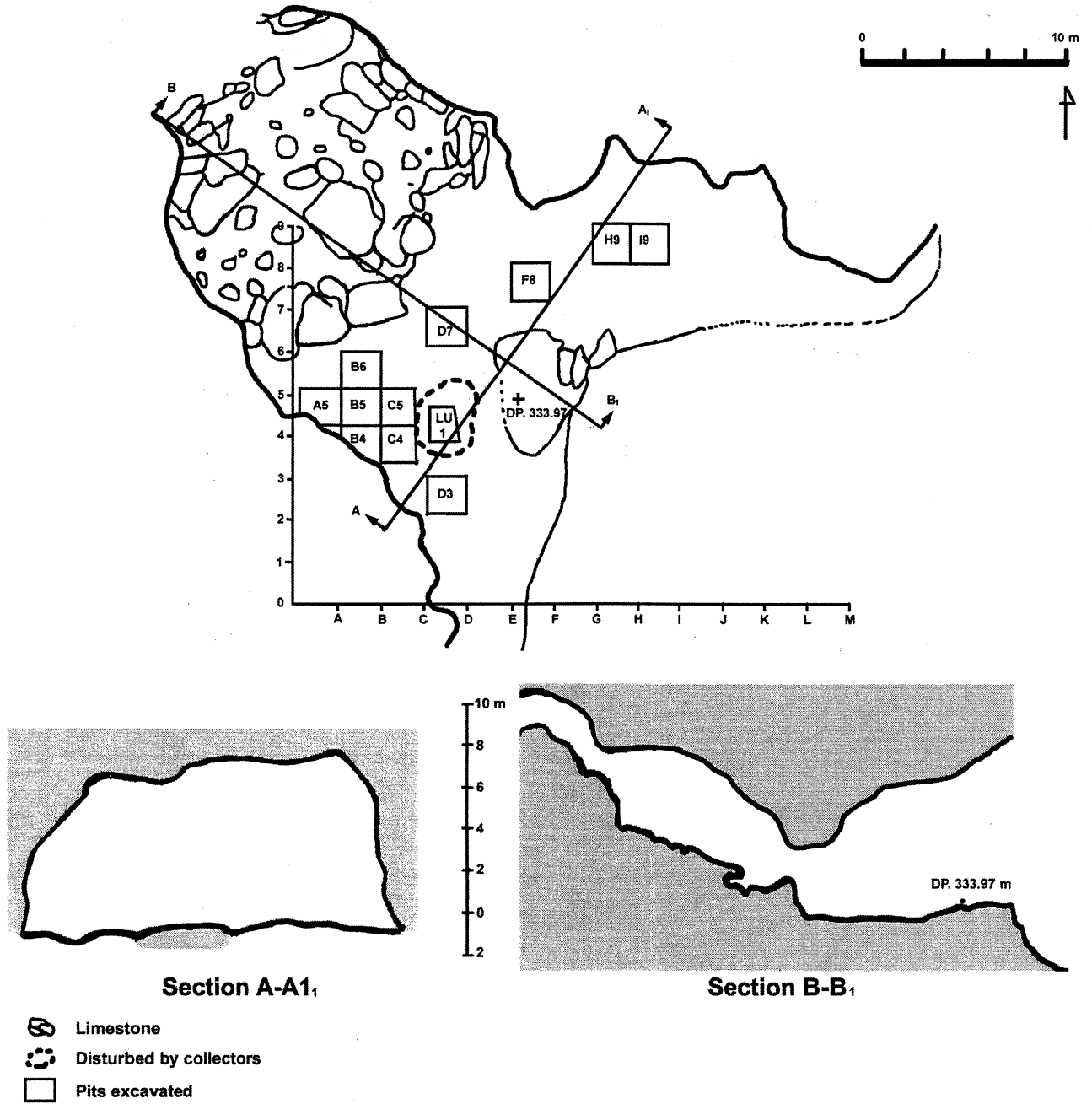


Figure 2: Excavation plan and cross-sections of Song Keplek.

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Table 1: Uncalibrated Holocene conventional radiocarbon dates (youngest and oldest) for Preneolithic assemblages in cave sites in East Java. Most of these C-14 dates (unless otherwise indicated) were analysed in Pusat Penelitian dan Pengembangan Geologi (P3G) Bandung), and have no identifying laboratory numbers.

Site	Dates BP (youngest and oldest)
Gua Braholo, western Gunung Sewu	4120±100 (P3G) 12060±180 (P3G)
Song Keplek, eastern Gunung Sewu	3260±110 (P3G) 8870±210 (P3G)
Song Terus, eastern Gunung Sewu	8340±340 (Beta 79118) 11200±600 (ST 9901)
Song Gentong, Campurdarat (Tulung Agung)	7090±70 (NZ 1754) 8760±190 (ANU 10584)
Gua Peturon, Tuban	5140±100 (P3G) 7670±120 (P3G)
Song Perahu, Tuban	6971 BP*
Gua Lawa, Sampung (Ponorogo)	3040±90 BP 8190±170 BP
Gua Macan, Puger (Jember)	2490±90 BP

*Cited from an unpublished paper by Lahagu, Fonali, Faisal Wisyahuiddin and Paul Pujiono, and measured in 1991 at the laboratory of BATAN (Badan Tenaga Atom Nasional).

The Preneolithic layers of Song Keplek are 2 m thick and characterised by very dense finds. These finds generally comprise lithic artefacts, faunal remains, bone tools, antler and shell tools, carbonised seeds, ornaments, hearths, and human burials. The lithic tools are very numerous, and generally comprise flakes with or without retouch. Typologically, the retouched flake tools include side, end and concave 'scrapers', denticulates, borers, points, arrowheads and knives (Figure 3). There are also unretouched and utilised flakes, cores, hammerstones, and pestles and mortars. Some pestles preserve traces of hematite on their surfaces. The faunal remains are very dense and dominated by *Macaca* sp; other important species include cervids, bovids, pigs, rodents, carnivores and molluscs (Simanjuntak 2001a).

Bone tools are very numerous, generally consisting of spatulas and points (Figure 4). They were commonly made on long bones and pelvic bones of cervids, bovids and pigs. Tools made on antlers have also been found, with one end of a branch worked to form a monofacial cutting edge. Also worth mentioning are tools made of marine mollusc shells, possibly used as scrapers or points (Prasetyo 2002). Ornaments were mainly made of mollusc shells in a variety of shapes, some of the intact shell with only a perforated apex. More commonly, shells beads were flaked into the desired shape (rectangular, triangular, circular, semi-circular,

oval or irregular) and the circular edges were normally ground, while the middle was perforated.

Song Keplek Cave, as most of the other cave sites in Eastern Java, also functioned as a burial place. The prehistoric inhabitants practised primary burial, where the dead were buried in a flexed (in most cases) or extended position. They also practised secondary burial, where only a selected part of the body (skull, long bones, etc) was reburied. Bioanthropological analysis of the human remains from this cave shows that they were related to Australians and Melanesians, except for one individual with strong Mongolid characteristics (Widianto 2002:233).

The Preneolithic occupation in Song Keplek also contained a thick hearth layer with charred artefacts and ecofacts, as well as other materials. Preneolithic charred seeds were frequently found, particularly in the upper horizon, including *Aleurites molluccana* (*kemiri* - candle-nut), *Canarium* sp. (*kenari* - canarium nut), and *Terminalia catappa* (*ketapang*). The lowest seed (*kemiri*) was found between two C-14 dates of 4510±90 BP (Beta 69689) and 5900±180 BP (P3G-1996) (Simanjuntak 2002:252).

The clear stratigraphic visibility, abundant finds and well dated layers in Song Keplek have stimulated us to propose that the Keplek period, from 12,000 - 4000 BP, had at least six main cultural characteristics:

1. Intensive exploitation of caves and rock shelters for habitation, workshop and burial activities.
2. An abundant lithic flake-tool industry.
3. Subsistence based on hunting and mollusc collecting.
4. Development of bone, antler and shell tool technologies.
5. Increasing seed exploitation towards the end of the period.
6. Primary and secondary burial practices.

HUMAN SETTLEMENT OF THE KEPLEK PERIOD ELSEWHERE IN EASTERN JAVA

All caves excavated in the eastern part of East Java generally preserve two distinctive cultural layers. In the uppermost part there is a thin Neolithic layer bearing potsherds and adzes, sometimes mixed with more recent objects, such as metal, glazed ceramics and glass. The second layer is always Preneolithic, represented by the Keplek assemblage. It is of interest to note that, except for the Gunung Sewu caves, there is no reported presence of the Tabuhan Late Pleistocene assemblage in any other caves in East Java. It is possible that the excavations conducted so far in these other caves have not yet reached this layer.

Keplek Period lithic artefacts are present in all of the excavated caves. The most common are flakes, and pestles and mortars. The most typical tool in this area is the arrowhead, characterised by a round base created by bifacial retouch (not to be confused with the concave-based arrowhead, which belongs to the Neolithic). Round-based arrowheads have mainly been found in the Gunung Sewu, Sampung, Dander, Tuban, Situbondo, and Puger caves (van Heekeren 1972:99). Flake tools are generally made of chert or *rijang*, a kind of silicified rock, which is very abundant in eastern Gunung Sewu, Lawa cave, and the Sampung and Tuban caves. Chalcedony, jasper and other rocks were frequently used to manufacture tools, as in Song Gentong, Campurdarat. However, in areas where chert was scarce, people were compelled to use limestone and other non-silicified rocks. The difficulties of making good tools from 'soft' materials did not deter the cave dwellers of Braholo Cave (western Gunung Sewu) and Macan Cave (Puger) from using them as raw material for tools.

Bone tools, as another typical cultural element, are present in all caves and are very abundant in Braholo, Keplek and Lawa. The most common tools are spatulas and points made of the long bones of cervids, bovids and pigs. Special attention can be given to the small bipoints (average length 1.5 cm) made of the long bones (tibia, fibula) of Aves species and *Macaca* sp. These are very abundant in Braholo Cave, and remind us of similar tools found in Song Gentong, although the latter are larger and have been classified as (double) points by Marliac and Simanjuntak (1998). Shell tools, such as scrapers and points, are also common in all caves during the Keplek period.

Faunal remains are abundant in all of the excavated caves. The most common genus, especially in the Gunung Sewu and Ponorogo region, is *Macaca* sp., which appears to have been the most important dietary item in the occupation period. Molluscs are present in all caves, but special attention must be given to Gua Macan in the coastal region of Puger (Jember), where marine molluscs are very dense (Asikin 2002). The presence of marine molluscs in inland

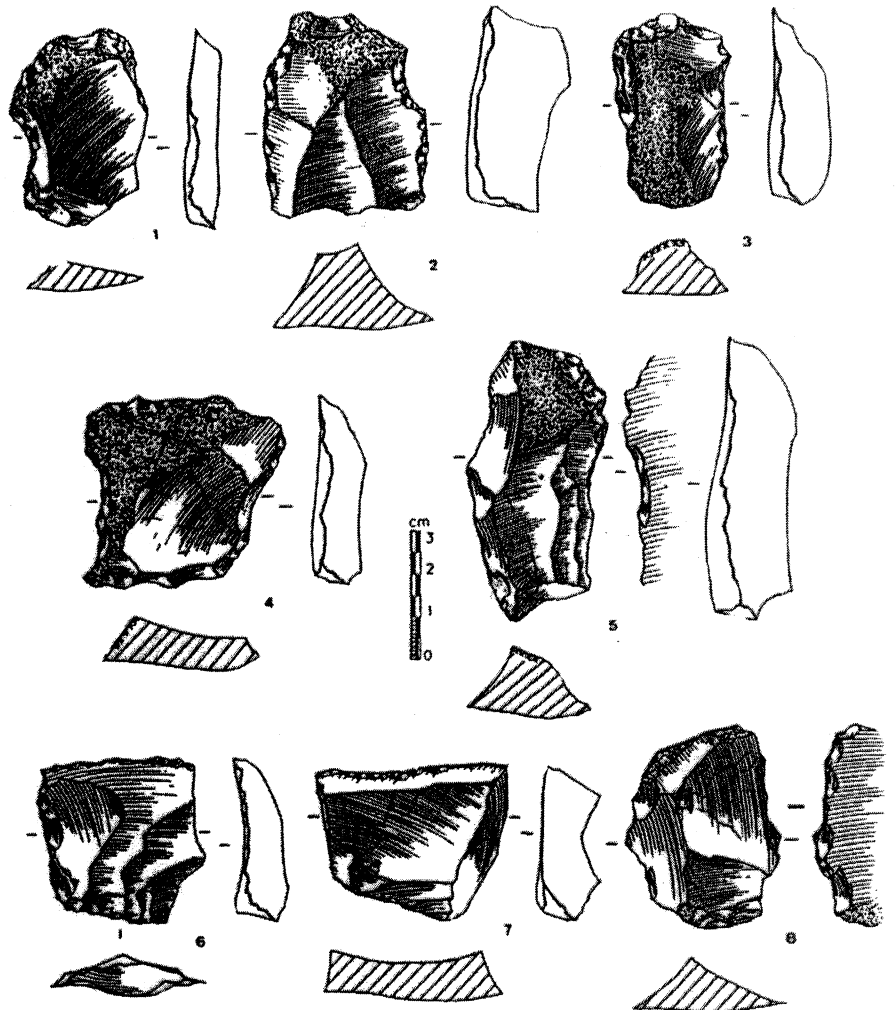


Figure 3: Flake tools from Song Keplek.

caves suggests either that the catchment area exploited by the cave dwellers extended to the coast, or that the molluscs were collected by coastal communities and exchanged (Simanjuntak 2002:152). Regarding the inland caves, such as the Dander and Sampung groups which are more than 50 km from the coast, the second possibility seems more likely.

Human burials have been identified in most caves, mainly primary and flexed with variations in hand, leg and body positions and orientations. Generally, the dead were buried lying on one side. The lower legs were flexed with knees extending upwards to the chest. In Song Gentong, one skeleton was flexed on its left side, orientated north-south with head in the north, and hands under the chin. Hematite powder had been sprayed around the chest, and a hematite nodule was placed close to the legs (Marliac and Simanjuntak 1998:50).

In Lawa Cave in Ponorogo, the dead were also flexed with hands under the chin or over the face. Some upper

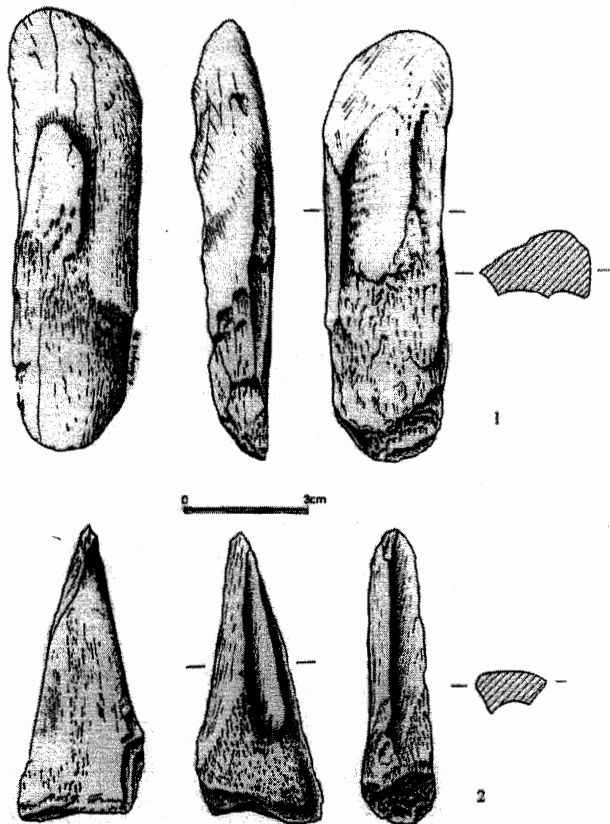


Figure 4: Bone tools from Gua Braholo.

bodies were covered with large slabs of rock, apparently to keep wild animals away or to prevent spirits from returning. One child burial was furnished with a necklace of perforated shells. According to Misberg and Jacob (see also van Heekeren 1972:96), this individual was predominantly of Melanesian morphology with some Australoid features. In Marjan Cave, Jember, a skeleton was placed on its back, with legs flexed in an east-west direction, and head towards the east. In Braholo (Gunung Sewu), Song Gentong and Marjan caves, limestone blocks also covered the upper bodies of some individuals.

SOME REMARKS

During the early Holocene Keplek Phase in East Java, a Preneolithic culture was created by a population of Australian/Melanesian morphological affinity, with certain individuals having some apparent Mongolid affinity (Widianto 2002), who occupied caves and rock shelters in the karstic hills (Simanjuntak 2001b). Lithic raw materials were generally chert or other kinds of silicified rock, but in certain regions, where silicified stone was not available (such as Gua Braholo), limestone was used as well. One widespread tool type is an arrowhead with a rounded base, typical of

this region but different from the Maros Points of South Sulawesi, in which the sides were bifacially retouched into serrated edges. Bone and shell tools were also very common in East Java.

The lithic industry represents a continuation of the local Late Pleistocene Paleolithic tradition (Simanjuntak 1997). Increasing mastery of the flaking technique led to greater variety in the types of flake tools present in the Holocene. Burial methods resembled those generally practised in Hoabinhian cave sites in Vietnam (Colani 1930) and Sumatra, and in Sarawak (Harrison 1957). The cave sites discussed have provided a better understanding of Early Holocene human settlement in East Java; in combination they can be regarded as representing a Preneolithic cultural unit typical of this region.

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Southeast Asia

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